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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/075,669	02/13/2002	Kevin E. Boyle	TRW(RG)5832	2678

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EXAMINER	
YEAGLEY, DANIEL S	
ART UNIT	PAPER NUMBER
3611	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/075,669	BOYLE ET AL.	
	Examiner	Art Unit	
	Daniel Yeagley	3611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 September 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *31-44 and 60-66* is/are pending in the application.

4a) Of the above claim(s) *37,38 and 66* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *31-44 and 60-65* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9/6/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. This application contains claims 37, 38 and 66 drawn to an invention nonelected, which was treated without traverse. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 31 – 44 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 31, line 31-32, the term "said first steerable *rear* wheel" lacks antecedent basis.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 31, 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts '925 in view of Rauter et al '474.

Roberts shows a steering system *for* steerable wheels comprising an axle assembly having an axle 16 with an intermediate portion and first and second end portions that are suspended by springs 22,24 and support steerable wheels that are pivotally mounted on the end portions *for* pivotal movement about a pivot axis that is transverse to a longitudinal central axis of the axle 16 (figure 1) and wherein the axle assembly includes a steering cylinder 32 *for* axial movement relative to the axle having a longitudinal central axis and an intermediate portion that at least partially define a chamber that supports a screw thread portion of a steering member 130, wherein the steering member is supported in the chamber along a linear path relative to the axle (figure 1-2), wherein a screw thread portion is disposed between a first and second end of the steering member 130 and is such that the steering member at numeral 66 in figure 2 is free of rack teeth, and further shows the steering system having at least one drive member 56 that is connected with an electric motor 50 and a ball nut 64 which is disposed in the chamber and associated with the screw thread portion and includes a takeoff assembly 40 connected with steering linkage 28 that are connected to the steering member and extends along an outer side of the axle to transmit movement of the takeoff assembly to the pivotally connected steerable wheels, and wherein the electric motor is effective to resist movement of the steering member (column 1, 6), but failed to show the steering cylinder being integral with the axle and failed to show the takeoff assembly having a portion projecting from an opening in the intermediate portion of the axle and cylinder arrangement and failed to show the electric motor being effective to resist movement of the steering member toward a straight ahead position.

Rauter discloses a hydrostatic or servo-assisted steering system which shows that prior art of incorporating a combination axle assembly having an integrated axle and steering cylinder 9

which includes a chamber in an intermediate portion of the axle assembly with first and second end portions of the axle connect to pivotally supported steerable wheels (figure 1), wherein the integral axle of Rauter further shows the prior art feature of incorporating a takeoff assembly from an intermediate portion of an axle rather than from the end portion, such that the takeoff assembly 6 projects from an opening in a chamber of the axle (figure 3) and is movable with the steering member in a linear path upon activation of the steering system, such that element 20 moves rotationally about a linear path and elements 23 and 7 both move in a linear path as broadly claimed, and wherein the steering system further includes the feature of first and second steering linkages 5 that connect to the linearly movable projecting portion 7 of the takeoff assembly, but failed to show springs suspending the axle (column 1-4).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified Roberts spring suspended ball and nut driven steering system and axle assembly with an integral axle assembly in order to provide a more compact steering axle assembly, much like that suggested by Rauter integral steering axle in order to reduce weight, cost and provide a better load-bearing axle body and steering assembly and effectively protects the steering system of Roberts ball/nut steering assembly, wherein Rauter further teaches the art of incorporating first and second steering linkages being connected to a takeoff assembly in an intermediate portion of a chamber of the axle rather than at an end of the takeoff assembly as suggested in figure 1 of Rauter, which clearly teaches the art of utilizing an opening the chamber of the axle to provide an alternative position for linking a steering assembly to steerable wheels and would have been obvious to one of ordinary skill in the art to have combined these features as claimed simply as an alternative position for linking the steering assembly of Roberts ball/nut

steering assembly to steerable wheels using an alternative linkage arrangement as suggested by Rauter steering linkage setup.

6. Claims 32 – 36, 39 – 40, 43 and 60 – 65 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts '925 as modified by Rauter et al '474 in further view of Ohmura et al '494.

Roberts as modified by the coaxial integrated axle and intermediate projecting steering linkage takeoff assembly of Rauter; as stated above, disclosed a steering system with an electric motor as broadly claimed but failed to disclose electric motor being outside the chamber and failed to disclose the spring assembly as claimed.

Ohmura shows a steering system with a steering assembly in a chamber of an axle with end portions 42 (figure 2) that support rear wheels 6 (figure 1), wherein the chamber is at an intermediate portion of the axle and supports a steering member (at numeral 84) and a ball nut 34 with screw thread portion 84 (column 3, line 24-35, column 5, line 11-13) and includes the feature of positioning an electric motor outside the chamber, wherein the motor is connected with the axle by at least one drive member 88 extending through an opening in the axle (figure 2), and includes a motor control circuitry operative to cause a generation readable as being back EMF in an electric motor 32 to resist movement of the steering member toward a straight ahead position (column 3-5, line 53-10), and includes the feature of a single spring assembly 98 being disposed in the chamber as claimed which biases the steering member toward a straight ahead position that includes fixed stops 100,102 disposed in the chamber and movable stops 94,96 that are movable relative to the fixed stops (column 5) with piston (rack 140) located between the

ball nut and the spring assembly and includes a locking member 46 capable of locking the steering member in a straight ahead position (column 6, line 17-21).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the steering system of Roberts as modified Rauter with an additional steering assembly component, such as a spring assembly, in order to return the steerable wheels to a straight ahead position with a degree of certainty yielding a satisfactory reliability in case the rear-wheel turning system fails as suggested by Ohmura for obvious enhanced safety and control of the vehicle.

7. Claim 44 is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts '925 as modified by Rauter et al '474 in further view of Shimizu '692.

Roberts as modified by the coaxial integrated axle and intermediate projecting steering linkage takeoff assembly of Rauter; as stated above, further disclosed a steering system with an electric motor connected to an output member 92 and a drive member 56 but failed to disclose the drive member being a belt extending part way around the ball nut and part way around the output member.

Shimizu discloses a steering system comprises an axle for supporting wheels (figure 1), wherein an intermediate portion of the axle includes a chamber comprising a ball nut 43 associated with a screw thread portion 42 of an elongated steering member 21 and supported in the chamber, wherein the steering member of Shimizu steering system discloses the prior art of utilizing a belt drive means for driving the steering member, wherein the drive belt is connected

between the electric motor and the ball nut for rotating the ball nut to drive the steering member as claimed.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the steering system of Roberts as modified by Rauter with an alternative drive means; such as a belt, like that suggested by Shimizu drive means to drive the ball nut utilizing a belt driven steering system in place of a gear driven means, simply as a matter of design choice dependent upon users preference because belts are old and well known alternative drive means in the art.

Response to Arguments

8. Applicant's arguments filed 9/6/06 with respect to claims 31 – 44, and 60 – 66 have been fully considered but they are not persuasive.

Roberts and Rauter; as stated above, disclose the combination of features as claimed and it is considered obvious to one of ordinary skill in the art to have combined these features as claimed because while Roberts discloses the ball/nut steering assembly and axle which are supported by suspension springs with a steering linkage 28 and takeoff assembly 40 that are movable along a linear path with respect to the axle and wherein the prior art reference to Rauter teaches the art of linking the steering linkage to the intermediate portion of a chamber on an integral axle assembly and as further modified by Ohmura; as stated above, which teaches the art of using a spring assembly with fixed stops disposed in a steering chamber to bias a member to a neutral straight ahead position within an axle as clearly suggested in column 5 of Ohmura.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986), and further applicant invention which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Roberts and Rauter both disclose a means for turning steerable wheels and therefore belong to a common technical field of analogous art and would have been obvious to one skilled in the art to have looked at these alternative steering systems which are obviously usable together to accomplishing the end result of turning steerable wheels.

In response to applicant's argument that it would not have been obvious to have substituted Roberts for steering mechanism for Rauter hydraulic steering mechanism, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of

the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning (based from applicants' own disclosure), it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Yeagley whose telephone number is (571)-272-6655. The examiner can normally be reached on Monday - Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lesley D. Morris can be reached on (571) - 272 - 6651. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

D.Y.

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